

## **PERFORMANCE MEASUREMENT IN MALAYSIAN CONTAINER HAULAGE INDUSTRY: A CRITICAL EVALUATION**

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### **ABSTRACT**

Evaluating operational performance is one of the most critical business activities as it helps organisations measure their competitiveness level. Knowing current performance level helps managers strategise what should be done to stay ahead of the competition as well as increase market presence. In this paper, the methods the container haulage industry in Malaysia used to measure their operational performance are critically evaluated. Based on primary data obtained from major players in the haulage industry, there is a lack of common benchmark for these haulage operators could use to measure industry performance. Instead, each haulage operators use their own performance measures which basically are simple input-output production ratios. Therefore, this paper proposes that a common performance measure is adopted as industry benchmark. The benefit of this common performance measure is the ability to identify the most efficient haulage operator with which other haulage players can benchmark.

**Keywords:** Performance measurement, efficiency, container haulage, transport, logistic

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## **1. Introduction**

The haulage industry in Malaysia is a multi-billion, oligopolistic industry with huge bank of fixed assets as their operating capital. Notably, these fixed assets include the haulers that move containers between customers' locations and the ports. Categorized as a logistic industry, the haulage industry is one of the key components in determining the efficiency and effectiveness of their customers, which generally means the entire supply chain of Malaysian industry. Therefore, in order to best serve their customers, the haulage companies must themselves be efficient and effective. One of the ways to determine this is through benchmarking.

Through benchmarking, the players in the haulage industry would be able to identify their position relative to their peers. For the best practice, knowing so will allow it to strengthen some of its current performance or even introduce new strategies to reaffirm its position.

As for the less-performing companies, the knowledge on their efficiency (or, lack of it) and the competitiveness level will present them with an invaluable opportunity to reconsolidate their business and operating plans so they are able to emulate the success of their best-practice peer.

## **2. A Review of Performance Measures Applied in Transport Industry**

### **a) Urban Transit System Canada**

The Canadian urban transit sector has been experiencing declining ridership in the 1990s (Boame, 2001), while the supply of transit services remained relatively stable. This research focused on addressing the question of technical efficiency in the Canadian urban transit sector from 1990 – 1998. The paper concludes that declining ridership and revenue increase the emphasis on efficiency in order to void increased subsidisation of transit systems.

b) Trucking Industry in the US

Another application of performance measure in the transport industry seen through the research titled *Productivity and Efficiency in the Trucking Industry – Accounting for Traffic Fatalities* by Weber and Weber (2004), where this research developed and estimated efficiency and productivity measures in the US trucking and warehousing industry during the years 1994 – 2000. The findings indicated that the trucking and warehousing industry did not operate efficiently in all 48 states in the US. If the industry were to operate efficiently, it could eliminate three to four fatal traffic accidents per state per year.

c) Urban Transit in the US

This research by Nolan (1996) studied the mid-sized bus transit agencies in the US, trying to address an issue of declining revenue by transit agencies. In order that the industry might maintain service within the present institutional framework, it is critical for agencies to identify aspects of production where efficiency gains can be found. This research also concluded that operating subsidies can create significant and negative impacts on efficiency.

d) Logging Truck Performance in the US

Another application of performance measure in the transport industry is seen in the research titled *Measuring and Evaluating Log Truck Performance in a Variety of Operating Conditions* conducted by McCormack and Robert James (1990). Findings from this research suggested that trucks were highly utilised and incurred considerable distances of unloaded running, which suggests inefficiency.

Here, based on these experiences abroad, it is clear that managing performance is important in the logistics industry as it entails considerable economic disadvantages if not properly managed.

### **3. Performance Measures By Container Haulage Industry in Malaysia**

#### **3.1 Kontena Nasional**

Kontena Nasional is a pioneer in container haulage industry in Malaysia. Since its formation in 1971, Kontena Nasional has been in container haulage operations for the past 35 years. Over the years, Kontena Nasional has been managing its operations in its own way with its own measurement standards.

To face the ever increasing competition in the industry, especially after the liberalisation of container haulage industry by the Government, Kontena Nasional has started to measure its performance. From the review of Kontena Nasional performance measures carried out by the company in 2005, it is observed that Kontena Nasional has a set of performance measures, measured on a weekly, monthly, quarterly and yearly basis. The measures are as follows:-

#### **i) Financial Measures**

##### **a) Revenue per TEU**

From the financial data gathered, the total revenue is measured against the total number of containers moved in twenty-foot equivalent units (TEU). This ratio of Revenue per TEU is measured in a weekly, monthly, quarterly and yearly basis.

This measure is merely a ratio and it is compared against the previous performance. It will give an indication to the management whether the ratio value is on upward trend or otherwise. It does not give any indication on the efficiency of the operations.

b) Revenue per km

Revenue figures from the financial data are measured against total distance covered by the Prime Movers. This measure gives a ratio of Revenue per km and it is compared against the previous performance by the management. This will only indicate the trend but not the actual efficiency of the operations.

c) Cost per TEU

The Costs are derived from financial data. These costs are operational costs and also total costs including the overhead. These costs are measured against total TEUs moved and are monitored and compared against past performances. This ratio will only indicate to the management the trend but not the real efficiency of the operations.

d) Profit per TEU

Profit derived from financial data is measured against the number of containers moved in twenty-foot equivalent units (TEUs). These give a ratio of profit to container unit moved and only give an indication to the management on the trend when compared to past performances.

e) Profit per Prime Mover

The profit derived from financial data is measured against the number of Prime Movers. This gives a ratio of profit to Prime Mover and will only indicate the trend, not the real efficiency of the operations.

ii) Productivity

a) Turnaround per Prime Mover

The turnaround is basically return trip made by the Prime Mover. The total number of return trips made derived from operational data is measured against the total number of Prime Movers gives the Turnaround to Prime Mover ratio. This ratio is monitored and compared with past performances to give an indication of the trend.

b) Turnaround per Driver

Another 'productivity' indicator, total number of trips made in a time period divided by total number of drivers to give an average trip made by each driver. This indicator gives the trend on number of trips made based on the number of drivers.

c) Distance per Prime Mover

The total distance travelled by the Prime Movers is measured against the number of Prime Movers which gives distance to prime mover ratio. This ratio is monitored, measured and compared to past performances and indicates the trend over time.

iii) Quality

a) Percentage of claim per Revenue

In container haulage operations, there bound to be accidents at customers premises like the trailer rammed into the guardhouse roof at entrance, the trailer landing gear sink into the ground causing damage either to the goods or to customers' premises, etc. Arising from these accidents, the customer will make a claim to the haulage company on the damage occurred. In view of

maintaining good customer relationship and to maintain the business with the shippers, more often than not the haulage company will pay for the damages.

Based on these circumstances, the total amount of customer claims captured under the financial expenses is measured against the revenue for a particular period. This will give a ratio or percentage of claim to revenue and indicates a trend over a given period as an indication of the performance of operations pertaining to damages due to accidents.

b) Customers complaint

This parameter is being measured in absolute numbers and compared with past performance to give an indication of the trend over time.

iv) Benchmarking

The only benchmarking used by Kontena Nasional is benchmarking against equipment manufacturer's standards pertaining to the performance of haulage equipments. This is monitored to assess the condition of the equipment used in haulage operations.

### 3.2 MISC Haulage Services

As for MISC Haulage Services, the management of operational performance is slightly different than those of Kontena Nasional. The metrics used by MISC Haulage Services are described below:

i) Total Delivery

Total Delivery is measured monthly, quarterly and yearly in terms of number of containers moved. This parameter is measured in twenty-foot equivalent units (TEUs) for both 20-foot containers and 40-foot containers.

ii) Quality of containers delivered (time base) and customer satisfaction

Quality of Containers Delivered is measured in terms of delivery of containers within the time frame as required by the customers. Containers delivered beyond this time frame are considered non-quality delivery. On the other hand, Customer Satisfaction is measured in terms of number of complaints received from the customers.

iii) No. of valid complaints vs. no. of complaints

Written complaints from customers are investigated to establish the validity, nature and causes of the problems. After the investigation, the complaints are classified as either valid or non-valid. Later, this classification is used to measure the percentages of valid complaints against total number of complaints.

iv) Equipment utilisation - % of availability

Equipment utilisation is measured in terms of ratio of available equipment against the total number of equipment in the fleet. This is the measure of percentage of equipment availability used by MISC Haulage Services.

v) Revenue per trip

This parameter is a measurement of total revenue generated averaged against the number of trips made within a time period. This will give the 'performance' indicator of revenue per trip done. Measurement frequency is monthly, quarterly and yearly.

vi) No. of deliveries (delivery per prime mover)

This measurement parameter is measured in terms of average number of deliveries done by each prime mover. The total number of deliveries in terms of

TEUs is divided by the number of available Prime Movers, which gives 'delivery per prime mover'. This gives the 'performance' indicator for each prime mover.

vii) No. of prime movers available

This measurement parameter is an absolute number measurement – the number of prime movers available to perform the haulage operational tasks. It is measured daily, weekly and monthly.

viii) Revenue

This measurement is a financial measurement measured in an absolute number – the total revenue generated by the haulage operations.

ix) Downtime of prime mover

This measurement is a measure of percentage of prime mover downtime against the total number of available time of the fleet. This measurement is the direct compliment of equipment utilisation measure to add up to 100% availability of the fleet.

x) Prime Mover Turnaround

This parameter is a measure of the number of trips made by each Prime Mover. It is derived from total number of trips made in a time period divided by the number of Prime Movers for the period, to give an average number of trips made by a Prime Mover. This measure gives a trend of 'productivity' of the Prime Mover.

### 3.3 Konsortium Logistik Berhad

Another key player of the haulage industry in Malaysia is the Konsortium Logistik Berhad. As the other two haulage operators – Kontena Nasional and MISC Haulage Services – Konsortium Logistik also employs a number of performance measures. These measures are described below:

i. Number of Containers Moved (TEUs)

This parameter is a measure of an absolute number of containers moved measured in twenty-foot equivalent units (TEUs). The frequency of measure is weekly, monthly, quarterly and yearly.

ii. Market Share

This measurement is a measure of percentage of market share performed by Konsortium against the total market share by other hauliers. This gives an indicator of how well Konsortium win the market in container haulage.

iii. Equipment Utilisation

This parameter is a measure of percentage of equipment utilised against the number of equipment available in the fleet. This gives an indicator of the extent to which the equipment are utilised to perform haulage operations.

iv. Revenue Per Trip

This parameter is an absolute number measurement on financial figures. The total revenue generated by haulage operations is divided by the total number of trips done by all Prime Movers, to give average revenue per trip. This is an indicator of haulage ‘performance’.

### 3.4 Multi-Modal Freight

Finally, another big player in the Malaysian haulage industry is Multi-Modal Freight which is a Klang Valley-based haulage operator. The description of the performance measurements used by Multi-Modal Freight is described briefly below:

i. Total Delivery

This parameter is a measure of an absolute number of containers moved by the haulage operations and it is measured in twenty-foot equivalent units (TEUs). Both 20-foot and 40-foot containers delivered are measured and totalled up to get Total Delivery. This is an indication of 'performance' by the container haulage operations.

ii. Equipment Availability

It is a measure of a ratio of available equipment for haulage operations against total number of equipment available in the fleet. This measure is both for Prime Movers and container trailers. This measure gives the operational managers an indication of capability to perform container haulage tasks.

iii. Revenue per Trip

This parameter is derived from financial figures – the total revenue generated by container haulage operations divided by the total number of trips performed to give Revenue per Trip. This is an indicator that gives revenue generating 'performance' by the haulage operations.

iv. Delivery per Prime Mover

This parameter is a measure of an average delivery in terms of twenty-foot equivalent units (TEUs) made by each Prime Mover. This is a 'productivity' indicator in terms of container haulage capability of the company. This

parameter is monitored to see the trend over time, comparing with past performances.

#### **4. Evaluation of Measurements by Container Haulage Industry in Malaysia**

From the observations made across the four major container haulage companies in Malaysia, it was found that there is no performance measure made to evaluate the efficiency of the system. The 'efficiency' is based on the technical efficiency of the system based on the definition by Sumanth (1984) that "*Efficiency refers to how well the resources are utilised to accomplish the results.*" Sumanth (1984) further defined *Total Productivity* as the ratio of net output to the sum of all input factors.

Based on above definitions by Sumanth (1984), clearly the container haulage companies in Malaysia are not measuring the efficiency of their container haulage system. Although some of the parameters measured are the input and output of the system which can be used to measure the efficiency of the system, those parameters are being monitored only to see the trend of 'performance' of the container haulage job rather than being used to measure the true efficiency of the system.

There are common parameters captured by the container haulage companies that could be used to measure the efficiency of the system, both for individual companies and the efficiency of the container haulage industry as a whole. The parameters are as follows:-

Input Parameters:

- Number of Prime Movers
- Number of Trailers
- Number of Drivers

Output Parameter:

- Number of Containers Moved (TEUs)

These parameters could be used to measure the relative efficiency of the system, both for individual container haulage companies and the industry as a whole. The tool that could possibly be used for 'common measure' based on 'common parameters' above is the Data Envelopment Analysis (DEA), as what has been applied in the transportation industry and also other industries.

## **5. Weaknesses in Current Industry Practice**

From the observations made, clearly the container haulage industry in Malaysia only look at the end results rather than complete operational processes. This could not help the individual companies and the industry understand their operational efficiency level. The container haulage companies also do not relate the performance parameters that they capture with efficiency computation. Hence, they could not perform relative operational efficiency analysis to understand their competitiveness.

Current measures used by the container haulage companies in Malaysia could not help to formulate strategies to improve the technical efficiency of the system. They could not benchmark the technical efficiency of container haulage system to establish the best practice.

## **6. Conclusion**

There is an opportunity to measure the technical efficiency of container haulage system in Malaysia and establish the common measure across the industry. This will lead to benchmarking the technical efficiency to establish the best practice and more importantly, to help the container haulage industry in Malaysia understands their relative performance to enable them to formulate strategies to improve their technical efficiency and avoid wastages in expensive capital investment on container haulage equipment.

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